IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

U.S.Patent
Application of: T. MATSUMURA
Serial Number : 10/606,707
Filed : July 25, 2003
For : LIGHT SENSITIVE COMPOSITION AND LIGHT SENSITIVE PLANOGRAPHIC PRINTING PLATE PRECURSOR
Group Art Unit: 1752
Examiner : BARBARA L. GILLIAM

DECLARATION UNDER 37 C.F.R. 1.132

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

I, TOSHIYUKI MATSUMURA, hereby declare and say as follows:

That I am a post graduate from Yokohama National University having been awarded a Masters Degree in Chemistry in March of 1998.

That since April of 1998, I have been employed by Konica Corporation, the owner of the above-identified application. During my employment, I have been engaged in the research and the study of planographic printing plates in the Research and Development Laboratory of my company.

That I am a sole inventor of the present application.

That I am familiar with the subject matter of the present invention.

What follows is an accurate summary of experiments conducted according to my detailed instructions and under my personal supervision, and the results obtained therefrom.

Comparative tests

1) The Examiner states in the outstanding Office Action, "The alkali-soluble urethane binder of Higashi et al., which is obtained by the reaction between (A) a diisocyanate compound containing an ethylenically unsaturated group and (B) a diol compound containing an alkali-soluble group, meets the present limitations of the addition polymerizable ethylenically double bond-containing monomer as claimed, and the addition polymerizable compounds of Higashi et al. including the polyfunctional acrylates and methacrylates meet the present limitations for the polymer binder." However, the present invention is distinguished from Higashi et al. in that the light sensitive planographic printing plate precursor comprises a polymer binder having an acid value of from 10 to 150. Higashi et al. are silent about the polymer binder as claimed. Accordingly, claims 1-10 are not anticipated by Higashi et al.

Further, in order to demonstrate criticality of the acid value of the polymer binder as claimed, comparative tests were carried out employing the closest prior art.

2) In order to compare the invention with the closest prior art, urethane binder A which the Examiner also points out, corresponding to the addition polymerizable ethylenically double bond-containing monomer as claimed, was synthesized and employed as the alkali-soluble urethane binder; and acryl copolymer 101 (comparative) having an acid value of 8, acryl

copolymer 102 (inventive) having an acid value of 12, acryl copolymer 103 (inventive) having an acid value of 145, acryl copolymer 104 (comparative) having an acid value of 155 were synthesized and employed as the polymer binder.

i) Synthesis of urethane binder A, corresponding to the addition polymerizable ethylenically double bond-containing monomer as claimed, and polymer binder

(Synthesis of urethane binder A)

Urethane binder A, corresponding to the addition polymerizable ethylenically double bond-containing monomer as claimed and falling within the scope as claimed, was synthesized in the same manner as in SYNTHESIS EXAMPLE 1 (p. 79, [0197]) of Higashi et al.), except that 0. 1 mol of the tertiary amine, Compound No. 67 as a diol component, which the Examiner also points out, was used instead of 0.075 mol of 2,2'-bis(hydroxymethyl)butanoic acid and 0.025 mol of propylene glycol diphenylmethane.

(Synthesis of acryl copolymers 101, 102, 103 and 104)

Acryl copolymer 101 having an acid value of 8, acryl copolymer 102 having an acid value of 12, acryl copolymer 103 having an acid value of 145, and acryl copolymer 104 having an acid value of 155 were synthesized in the same manner as acryl copolymer 1 of Example 1 of the present Specification, except that the addition amount of methacrylic acid and methyl methacrylate was changed.

3) Preparation of photopolymerizable light sensitive layer coating liquids

Photopolymerizable light sensitive layer coating liquids 101, 102, 103, and 104 were prepared in the same manner as in photopolymerizable light sensitive layer coating liquid 1 of Example 1 of the present Specification, except that the urethane

binder A was used instead of the addition polymerizable ethylenically unsaturated bond-containing monomer, and acryl copolymers as shown in Table 3 were used instead of acryl copolymer 1.

4) Preparation of light sensitive planographic printing plate precursor sample

Light sensitive planographic printing plate precursor samples 101, 102, 103 and 104 were prepared in the same manner as in Example 1 of the present Specification, except that the photopolymerizable light sensitive layer coating liquid obtained above was used. Constitution of the resulting samples obtained above is shown in Table 3 for easier comprehension.

5) Evaluation

Each of the resulting light sensitive planographic printing plate precursor samples was imagewise exposed at an exposure energy of 100 $\mu J/cm^2$ at a resolving degree of 2400 dpi, employing a plate setter Tiger Cat (produced by ECRM Co., Ltd.) equipped with a light source emitting light with a wavelength of 532 nm. Herein, dpi represents the dot numbers per 2.54 cm. The image pattern used for exposure comprised a solid image and a square dot image with a screen number of 175 LPI and a 50% dot area. Subsequently, the exposed sample was subjected to development treatment employing a CTP automatic developing machine (PHW 23-V produced by Technigraph Co., Ltd.) to obtain a planographic printing plate. Herein, the developing machine comprised a preheating section for preheating the exposed sample at 105° C for 10 seconds, a pre-washing section for removing the oxygen shielding layer before development, a development section charged with developer having the following

developer composition, a washing section for removing the developer remaining on the developed sample after development, and a gumming section charged with a gumming solution (a solution obtained by diluting GW-3, produced by Mitsubishi Chemical Co., Ltd., with water by a factor of 2) for protecting the surface of the developed sample. Thus, printing plate samples 101, 102, 103 and 104 were obtained from light sensitive planographic printing plate precursor samples 101, 102, 103, and 104, respectively.

The resulting printing plate sample was mounted on a plate cylinder of a press (DAIYA1F-1 produced by Mitsubishi Jukogyo Co., Ltd.), and printing was carried out employing a coat paper, printing ink (soybean oil-based ink "Naturalith 100" produced by Dainippon Ink Kagaku Kogyo Co., Ltd.), and dampening water (SG-51, H solution produced by Tokyo Ink Co., Ltd., Concentration: 1.5%).

The number of prints printed from the beginning of the printing till when stain at non-image portions was removed and an ink density at solid image portions of 1.5 or more was obtained was counted as initial printability. A less number of the prints shows higher initial printability and reduced printing paper loss. The ink density was measured employing DensiEye 700 produced by GretagMacbeth AG.

The results are shown in Table 3.

Table 3

Light sensitive planographic printing plate precursor sample No.	Light sensitive composition No.	Acryl copolymer used (Acid value)	*Monomer used	Initial printability (number of prints)	Remarks
101	101	101 (8)	Urethane binder A	30	Comp.
102	102	102 (12)	Urethane binder A	10	Inv.
103	103	103 (145)	Urethane binder A	10	Inv.
104	104	104 (155)	Urethane binder A	30	Comp.

Inv.: Inventive, Comp.: Comparative,
*Monomer as an addition polymerizable ethylenically double bond-containing monomer as claimed

As is apparent from Table 3 above, inventive light sensitive planographic printing plate precursor sample 102 and 103 provide higher initial printability as compared with comparative light sensitive planographic printing plate precursor sample samples 101 and 104. That is, inventive samples provide reduced loss of printing paper. The results are unexpected to one of ordinary skill in the art. In view of the above, the present invention is not anticipated by, nor obvious over, Higashi et al.

Accordingly, I believe that instant claim 1, and all the claims, which depend therefrom, are in a situation of allowability.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001, of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: October 08, 2004

Toshiyuki Matsumura

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